Amendments to the Specification:

Please substitute the following paragraphs for the corresponding paragraphs beginning at the indicated location in the specification as originally filed.

(Page 2, Lines 9+):

On the other hand, in optical communication, it is desired to prevent reflected and returning light in optical paths. In addition, it is necessary that the reflection on the surfaces of the optical devices is as small as possible. For such antireflection, a method of forming a multi-layered dielectric film on the surface of an optical device ~~deice~~ is the most popular.

(Page 2, Lines 15+):

However, in the resin forming technique mentioned above, the UV-curable monomer ~~much~~ shrinks substantially in the step of photopolymerization thereof, and it could not often satisfy the designed dimensional accuracy that is necessary for optical devices. Another problem with the technique is that resin is not resistant to heat, and therefore, the temperature of the substrate on which a multi-layered dielectric film is formed must be kept low. Still another problem is that the quality and the durability of the multi-layered dielectric film are not so good.

(Page 3, Lines 2+):

The invention has been made to solve the problems in the related art as described above~~, and its one~~. One object of the invention is to provide a protrusion-groove microstructure profile of resin of which the thermal shrinkage in molding is ~~small~~ minimal and the dimensional accuracy is high. Another object of the invention is to provide an optical device with a multi-layered dielectric film, which has good heat resistance, good desired properties and good durability.

(Page 4, Lines 11+):

Having a linear thermal expansion coefficient of at most 190 ppm/°C, the solid

composition is deformed little by the ambient temperature change, and therefore the film-forming temperature at which a multi-layered dielectric film is formed on the surface of the solid composition layer-coated substrate may be high. The multi-layered dielectric film formed at such an elevated temperature may have a dense structure, and its heat resistance and moisture resistance may be ~~bettered~~ better.

(Page 5, Lines 15+):

The predetermined surface profile of the optical device of the invention is formed by molding the solid composition, for which, therefore, is used ~~is~~ a fluid composition containing a polymerizable organic group, and this is polymerized and cured through exposure to light or thermal energy. The photopolymerization or thermal polymerization for ~~it~~ the polymerizable organic group is addition polymerization, and the shrinkage of the film thus cured in that mode is therefore lower than that of the film formed through dehydrating condensation. Accordingly, the photopolymerization or thermal polymerization that is employed in the invention is effective for satisfying the requirement of the dimensional accuracy necessary for optical devices.

(Page 6, Lines 22+):

The multi-layered dielectric film in the invention is essentially for antireflection. Formed of the material selected from the above, the multi-layered film may serve as an optically-stable and durable antireflection film. For example, the film may be a two~~-layered~~ or more multi-layered film of TiO_2/SiO_2, Ta_2O_5/SiO_2, ZrO_2/SiO_2, TiO_2/MgF_2 or the like, and it is desirable that the film is adequately planned in point of the thickness and the material of each layer thereof, depending on the intrinsic parameters of the film such as the wavelength of light to run through the film and the reflection attenuation of light to return through it. Preferably, in general, the thickness of each layer of the multi-layered dielectric film falls between 1 and 600 nm, more preferably between 10 and 400 nm.

(Page 8, Lines 3+):

Also preferably, the substrate in the invention is ~~so~~ selected so that it transmits light of

which the wavelength falls within a predetermined range. This makes it possible to apply light to the side of the substrate for curing the composition through optical polymerization thereof via the substrate. In that case, in addition, the optical devices thus fabricated may function as transmission optical devices.

(Page 11, Lines 8+):

Examples of the photopolymerizable organic group are an epoxy group, an acryloxy group, a methacryloxy group, a vinyl group, and organic groups containing any of them. Examples of the thermally-polymerizable organic group are an epoxy group, a vinyl group, and organic groups containing any of them. When the polymerizable organic group is an epoxy group, then the compound must contain at ~~lest~~ least one such group in the molecule; but when the polymerizable organic group is an acryloxy group, a methacryloxy group or a vinyl group, then the compound must contain at least two such groups in one molecule.

(Page 21, Lines 1+):

The refractive index of the cured products of the fluorinated epoxy compounds is lower than that of the cured products of the alicyclic epoxy compounds or the aromatic epoxy compounds. Therefore, the fluorinated epoxy compound may be mixed with any other liquid epoxy compound for controlling the refractive index of the cured products of the mixture. In addition, since the cured products of the fluorinated epoxy compounds have good water repellency and oil repellency, the compounds are effective for improving the moisture resistance and the chemical resistance of the solid composition layer of the optical device of the invention. One or more of these epoxy compounds may be used herein either ~~singly~~ individually or ~~as~~ combined.

(Page 22, Lines 18+):

The amount of the silane coupling ~~gent to be~~ agent in the fluid composition may be at most 10 % by weight of the composition.

(Page 24, Lines 12+):

The essential object of the multi-layered dielectric film to be in the optical device of the invention is for antireflection on the surface of the device. For realizing the necessary antireflection property thereof, the optical device has a two~~-layered~~ or more multi-layered film of TiO_2/SiO_2, Ta_2O_5/SiO_2, ZrO_2/SiO_2, TiO_2/MgF_2 or the like, and it is desirable that the film is adequately planned in ~~point~~ terms of the thickness and the material of each layer thereof, depending on the intrinsic parameters of the film such as the wavelength of light to run through the film and the reflection attenuation of light to return through it. Preferably, in general, the thickness of each layer of the multi-layered dielectric film falls between 1 and 600 nm, more preferably between 10 and 400 nm.

(Page 25, Lines 7+):

For protecting the surface profile of the solid composition layer formed on the substrate and for enhancing the adhesiveness between the solid composition layer and the antireflection film formed on it, it is desirable that an SiO_2 film is additionally formed between the solid composition layer and the multi-layered dielectric layer. Any material other ~~material~~ than SiO_2 may be selected for the interlayer. Preferably, the thickness of the interlayer is from 1 to 300 nm, more preferably between 10 and 150 nm.

(Page 25, Lines 16+):

For fabricating the optical device of the invention that has a predetermined surface profile as described above, there are ~~mentioned~~ two typical methods mentioned below.

(Page 25, Lines 19+):

One method (~~this is~~ hereinafter referred to as a mold casting method) comprises casting a fluid composition onto a mold and degassing it. Next, the mold with the composition thereon is ~~jointed~~ joined with a substrate, and heated or exposed to UV light. Through this, the composition is cured. The cured composition is released from the mold, and then this is optionally heated.

(Page 26, Lines 18+)

Next, a substrate 20 is brought into contact with the fluid composition 30 on the mold 10 in such a controlled condition that no space exists between the fluid composition 30 ~~20~~ and the surface of the substrate 10, whereby a layer of the fluid composition 30 is sandwiched between the substrate 20 and the mold 10 (Fig. 1B). In ~~that~~ the condition shown in Figure 1B, the stacked arrangement~~, this~~ is kept at 20 to 100°C for 1 to 30 minutes while being exposed to UV light, or is heated at 140 to 180°C and kept as such for 10 to 120 minutes to thereby polymerize and cure the fluid composition.

(Page 27, Lines 2+):

In the case where the composition is exposed to UV light, at least one of the substrate ~~10~~ 20 and the mold 10 shall be formed of a UV-pervious material. Next, the mold 10 is peeled to release the cured product from it. The process gives a solid composition layer 32 which has a reversed protrusion-groove microstructure profile corresponding to but reversed from the protrusion-groove surface profile of the mold 10 and which has a high glass transition temperature, formed and bonded to the surface of the substrate 20 (Fig. 1C).

(Page 27, Lines 11+):

Optionally, ~~this~~ the cured product is finally heated under ordinary pressure or a reduced pressure of from 2 to 5 Pa at 100 to 200°C for 15 to 250 minutes, whereby the polymerization initiator and the non-polymerized monomer that may remain in the solid composition layer are vaporized away. Thus processed, the solid composition layer may shrink a little in the direction of the thickness thereof to be a denser film. The thus-formed solid composition layer 32 that has a predetermined surface profile structure is coated with a multi-layered dielectric film 40, as in Fig. 1D, to give an optical ~~deice~~ device 100 of the invention.

(Page 27, Lines 22+)

Another method (~~this is~~ hereinafter referred to as a substrate casting method) comprises casting a fluid composition directly on the surface of a substrate, then degassing it, and thereafter pressing a mold against the fluid composition on the surface of the substrate,

and exposing it to UV light or heat in that condition for transfer molding the composition. After this, the cured product is released from the mold and then optionally subjected to a final heating treatment.

(Page 29, Lines 3+):

~~In case where~~ Where the composition is exposed to UV light, at least one of the substrate and the mold shall be formed of a UV-pervious material. Next, the mold is peeled to release the cured product from it. The process gives a solid composition layer which has a reversed protrusion-groove microstructure profile corresponding to but reversed from the protrusion-groove surface profile of the mold, formed and bonded to the surface of the substrate.

(Page 29, Lines 18+):

The thus-formed solid composition layer that has a predetermined surface profile structure is coated with a multi-layered dielectric film to give an optical ~~deice~~ device of the invention.

(Page 30, Lines 11+):

Preferably, the expansion coefficient of the core material for the mold is similar to that of the release film. Resin molds have the advantages in that they may be readily processed to have microstructures and may also be readily processed to have a desired shape; ~~wile~~ while glass or metal molds have the advantages in that they have good heat resistance and high mechanical strength and their durability is high.

(Page 31, Lines 19+):

The film is highly flexible (that is, it is not brittle), and its mechanical strength is high, and the film is therefore hardly cracked. In addition, any foam that may be formed during molding is not found inside the film, and the film ~~shrink little~~ shrinks minimally while molded. Accordingly, the film realizes extremely excellent transferability and the dimensional accuracy in forming the protrusion-groove microstructure profile on the film

surface is extremely high. Concretely, for example, when a large number of protrusions having a height of from 20 to 100 mm are formed, the height fluctuation in the film surface protrusions is at most 1 mm. In addition, the misregistration between the neighboring protrusions in the film surface from the pattern of the mold falls within a range of measurement error (at most 0.2 mm).

(Page 33, Lines 18+):

~~In case where~~ Where a transparent substrate that is pervious to light in service for optical devices of the invention, for example, visible light, UV light or IR light is used for the substrate in he invention, then the optical devices of the invention may function as transmission optical devices such as lens arrays, diffraction gratings (e.g., echelette gratings, echelon gratings, echelle gratings), Fresnel lenses and others.

(Page 40, Lines 23+):

A microlens array was fabricated in the same manner as in Example 1 using the same substrate and the same mold as in Example 1. In this, however, an acrylic acid monomer that had a ~~to have~~ Tg of 30°C after being cured was used in the absence of a solvent, in place of the molding composition A used in Example 1.

(Page 43, Lines 16+):

The focal distance of the microlens of this structure was from 3.300 to 3.303 mm. 100 convex lenses were randomly selected in the film-coated, protrusion-groove microstructure, and their dimensions including the height of the convex lens part were measured. The mean height was 72.3 mm, and the standard deviation was 0.13 mm. Calculated from ~~these~~ this data, the shrinkage of the cured film was about 2 %, and the spherical aberration of the microlenses measured with He-Ne laser (l = 633 nm) was RMS = 0.05 l with a standard deviation of 0.001 l.

(Page 45, Lines 25+):

The data in the Examples mentioned above confirm that the lenses formed of a resin having a linear thermal expansion coefficient of at most 150 ppm/°C all have good weather resistance including the antireflection film thereof. Resins having a linear thermal expansion coefficient of at most 170 ppm/°C are effective for realizing the advantages as above; and those having a linear thermal expansion coefficient of at most 190 ppm/°C are acceptable for practical use. ~~Needless to say, the~~ The resins of the type are not limited to convex lenses but are applicable to any others such as transmission gratings and Fresnel lens optical devices of good weather resistance, depending on the predetermined surface profile formed thereon.

(Page 46, Lines 12+):

Further, the data in the Examples mentioned above confirm that the lenses formed of a resin of which the weight reduction in heat treatment at a temperature not higher than the glass transition temperature thereof is at most 0.7 % by weight all have good weather resistance including the antireflection film thereof. Resins of which the weight reduction in heating is at most 1.0 % by weight are effective for realizing the advantages as above; and those of which the weight reduction in heating is at most 1.3 % by weight are acceptable for practical use. ~~Needless to say, the~~ The resins of the type are not limited to convex lenses but are applicable to any others such as transmission gratings and Fresnel lens optical devices of good weather resistance, depending on the predetermined surface profile formed thereon.